



EPA Region 7 TMDL Review

TMDL ID 354 **Water Body ID** 19

Water Body Name Tar Creek

Pollutant Lead, Cadmium, and Zinc

Tributary

State KS **HUC** 11070206

Basin Neosho

Submittal Date 01/13/2005

Approved yes

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

Letter received by EPA January 13, 2005, formally submitting this TMDL for approval under Section 303(d).

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

The loading capacity is defined by the numeric water quality criterion for lead, cadmium, and zinc, which is hardness-dependent. The endpoint is for total lead, cadmium, and zinc concentrations to remain below the chronic criteria at all flows. Protection to chronic conditions will provide for protection at acute levels as well. The TMDL was developed using the chronic WQS criteria derived from observed hardness at various flow conditions; historic and target TMDL values are displayed graphically in load duration curves covering the range on flows for each pollutant. The TMDL curve is based on water quality standards (WQS) attainment and achievement of the expected aquatic life use.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The TMDL describes all applicable WQS and the beneficial uses; the impaired use is the expected aquatic life use. The target is the water quality criteria for chronic lead, zinc, and cadmium toxicity.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The target is the water quality criteria for chronic toxicity; the link between the target and each criterion is hardness-dependent. No statistically significant relationship was found to relate hardness with flow; therefore, the observed hardness at various flow conditions were used to establish the targets.

The load duration curve was used to calculate the TMDL in general because it relies on measured water quality data and paired water hardness data, and a wide range of "flow exceedance" data representing a complete range of flows anticipated in Tar Creek. In calculating the TMDL the average condition was considered across the seasons to establish goals of the endpoint and desired reductions. Therefore, the target levels were multiplied by the average daily flow for Tar Creek across all hydrologic conditions which is represented graphically by the integrated area under the load duration curves.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Land use and sources in the watershed are described. The extensive mining in the area has affected both surface and groundwater resources. The metals in Tar Creek are elevated because of these mining influences. All significant sources are discussed.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

The allocation of wasteloads (WLAs) and load allocations (LAs) are made in terms of targeted loads. The TMDL curve displays the targets over the range of flow. A very minor contribution is made to the total load from the single point source.

WLA Comment

The WLAs are 0.003463 pounds/day total lead, 0.001222 pounds/day total cadmium, and 0.065732 pounds/day total zinc. The loads are based on end of pipe criteria.

LA Comment

The LA is shown by the integrated area between the TMDL less the MOS curves, and the WLA line for all flows.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The margin of safety is explicitly set at a 10 percent reduction in the hardness used to set the TMDL curves.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Seasonal variation and critical conditions are considered in the use of the load duration curve methodology which accounts for loads at all flow conditions.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

Public meetings to discuss TMDLs in the Neosho Basin were held January 9, 2002, in Burlington, March 4, 2002, in Council Grove, and July 30, 2004, in Marion. Public hearings were held in Burlington and Parsons on June 3, 2002. The Neosho Basin Advisory Committee met to discuss the TMDLs in the basin on October 2, 2001, January 9, March 4, and June 3, 2002. The TMDL was public noticed on the KDHE TMDL website: <http://www.kdhe.state.ks.us/TMDL>.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

KDHE will continue to collect bimonthly samples at rotational Station 110 in 2005 and 2009 including total lead, zinc, and cadmium samples. More intensive sampling may be conducted if monitoring indicates continued impaired status.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

Reasonable assurance, although not necessary for this TMDL since the point source contribution is inconsequential, includes numerous authorities and funding through the Kansas Water Plan.
